



Deliverable summary D2.1

Reports on key drivers of invasiveness and emergence of forest PnPs

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Dissemination Level	
PU Public	PU
CI Classified, as referred to Commission Decision 2001/844/EC	
CO Confidential, only for members of the consortium (including the Commission Services)	

1. Summary

One of the objectives of WP2 is to develop a generic and comprehensive modelling framework to assess the risk of invasion or emergence of forest pests and pathogens (PnP). For this purpose, we aim first at identifying key drivers of species invasiveness and emergence. This is an important step as these drivers will be the heart of the generic models developed later in the project. Identification of the drivers is split into two parts: drivers of invasiveness (WUR partner) and drivers of emergence (INRAE partner).

First, we provide the definition of what we call “invasiveness” and “emergence”. This step is necessary because there is no agreed definition of either term.

Then, we report the literature review that was conducted to highlight the drivers of invasiveness (ca. 400 papers reviewed) and emergence (ca. 500 papers reviewed but only 124 actually provided information about the emergence driver).

For invasiveness, key drivers depend on the invasion phase (entry, establishment, spread and impact). The main driver of entry is the propagule pressure, which is closely associated with international trade and the importation of infested materials. Drivers of establishment are: propagule pressure, availability of suitable or susceptible habitat, and pest traits. The main driver of spread is related to species traits at local scale and to variables describing the human activity (e.g., Gross Domestic Product or human population density) at large scale. Drivers of impact are related to habitat suitability, the PnP spread and the level of expected damage by this PnP and the economic value of the host. Correlative models will be developed based on these drivers associated with each invasion phase.

For emergence, climate and extreme events (e.g., storm and drought) were the main drivers of species emergence, but biotic factors (e.g., parasitism) and landscape properties (e.g., forest composition and topography) could also be important to consider. Even if it is not a true driver, management is also an important factor to take into account in the prevention of PnP emergence. In terms of modelling, two approaches are foreseen based on these drivers: either for a given region to predict the PnP species (or range of species) that could emerge, or for a given PnP species to predict changes in its distribution.